

# FAO Plant Protection Bulletin

A Publication of the

World Reporting Service on Plant Diseases and Pests

## TABLE OF CONTENTS AND INDEX TO VOLUME TWENTY-TWO

1974

# TABLE OF CONTENTS

## No. 1 - FEBRUARY

Injection of mycoplasmacides and insecticides into woody plants: a possible method of controlling mycoplasma-associated diseases and their vectors, <i>R.E. Schwarz</i>	1
<i>Pistia stratiotes</i> in Kossou Lake, Ivory Coast, <i>Hugh F. Mulligan</i>	7
A green cassava mite recently found in Africa, <i>William F. Lyon</i>	11
Research and training for the control of plant diseases at international research centres, <i>John L. Nickel</i>	14
Relationship between cotton phyllody and a similar disease of sesame, <i>M. Desmidtts and J. Laboucheix</i>	19
Outbreaks and new records India, Malaysia, Senegal	21
News and notes	26

## No. 2 - APRIL

Current distribution of rust of groundnut and known sources of resistance, <i>K.R. Bromfield</i>	29
Disease of pigeon pea in the Caribbean area: an electron microscopy study, <i>K. Maramorosch, H. Hirumi, M. Kimura, J. Bird and N.G. Vakili</i>	32
The role of grazing animals in the dissemination of the onion white-rot pathogen in Egypt, <i>Sami Mikhail, D.M. Stewart, M.Kh. El Haggagy and R.E. Wilkinson</i>	37
The commodity in-depth projects of North Carolina State University in Peru: a model bi-lateral aid programme, <i>E.R. French and J.L. Apple</i>	42
Outbreaks and new records Bangladesh, India	48
Plant quarantine announcements Turkey, United Kingdom	52
News and notes	52

### No. 3 - JUNE

Potato wart disease, its introduction to North America, distribution and control problems in Newfoundland, <i>Michael C. Hampson and Kenneth G. Proudfoot</i>	53
Possibility of supervised plant disease control in pest management systems, <i>L. Chiarappa</i>	65
Occurrence of plant parasitic nematodes in Montserrat, West Indies, <i>C.W.D. Brathwaite</i>	69
Plant quarantine announcement Fiji	71
Outbreaks and new records Ghana, India	72
News and notes	75

### No. 4 - AUGUST

Principles and methodology of biological weed control, <i>L.T. Kok</i>	77
Losses caused by the paddy bug and "red rice" in Guyana, <i>B.K. Rai</i>	82
Effect of insecticides and fungicides on yield of paddy rice in Kyushu, Japan, <i>O. Mochida</i>	87
Outbreaks and new records India, Saudi Arabia, Sri Lanka, United States	92
Plant quarantine announcement Guam	97
News and notes	100

### No. 5/6 - OCTOBER/DECEMBER

Resisting resistance	101
Recommended methods for the detection and measurement of resistance of agricultural pests to pesticides	
10. Tentative methods for spider mites and their eggs, <i>Tetranychus</i> spp. and <i>Panonychus ulmi</i> (Koch)	103

11. Tentative method for adults of the codling moth, <i>Laspeyresia pomonella</i> (L.)	108
12. Tentative method for adults of the Colorado potato beetle, <i>Leptinotarsa decemlineata</i> (Say)	112
13. Tentative method for adult locusts, <i>Schistocerca gregaria</i> Forsk., <i>Locusta migratoria migratorioides</i> R. and F. and <i>Nomadacris septemfasciata</i> Serv.	117
14. Tentative method for larvae and adults of sheep blowflies, <i>Lucilia</i> sp.	122
15. Tentative method for adults of some major beetle pests of stored cereals with malathion or lindane	127
Presence of mycoplasma-like organisms in plant species affected by "yellows" symptoms in Upper Volta — relationships with cotton phyllody, <i>M. Desmidts</i> and <i>A. Rassel</i>	138
Plant quarantine announcement	142
News and notes	144

# INDEX

- Acacia albida*, disease, Upper Volta, 138  
*Achaea faber*, mango, Ghana, 72  
*A. lienardi*, mango, Ghana, 72  
*Aeschynomene virginica*, biological control, United States, 79  
*Agaricus* sp., pest, India, 51  
 Ahmed, S., 48  
 Aleurodidae, vectors of viruses, 79  
*Allium cepa*, disease, Egypt, 37; pests, Montserrat, 69  
*Alstonia scholaris*, pest, Bangladesh, 48  
*Alternaria cuscutacidae*, weed, control, U.S.S.R., 79  
*Ananas comosus*, pests, Montserrat, 69  
*Aphelenchoides* spp., crops, Montserrat, 70  
*Aphelenchus* spp., Montserrat, 70  
 Aphididae, vectors of viruses, 79  
 Apple, diseases, Sri Lanka, 69  
 Apple, J.L., 42  
*Arachis hypogaea*, disease, distribution, 29; pests, Montserrat, 69  
 Arafat, A., 93  
*Arenipes sabella*, *Phoenix dactylifera*, India, 21  
*Aspergillus* spp., pest, 51  
*Atherigona butuberculata*, wheat, India, 74  
*A. naqvii*, wheat, India, 75  
*A. oryzae*, wheat, India, 74  
 Azinphos-methyl, resistance testing, 111
- Basu, B., 92  
 Batra, R.C., 21  
 Beet, nematode, Senegal, 24; see also *Beta vulgaris*  
*Bemisia tabaci*, 32  
 Benlate, disease control, 92  
*Beta vulgaris*, pest, 97; see also Beet  
 Bhatnagar, V.S., 50  
 BHC, prohibited, Japan, 88  
 Bird, J., 32  
*Boehmeria nivea*, disease, India, 92  
 "BP" treatment of mycoplasma, woody plants, 1  
 BPMC, pest control, Japan, 88  
*Brassica oleracea* var. *capitata*, pests, Montserrat, 69; see also Cabbage  
*B. rapa*, pests, Montserrat, 69  
 Brathwaite, C.W.D., 69  
 Bromfield, K.R., 29
- Cabbage, nematode, Senegal, 24; see also *Brassica oleracea* var. *capitata*  
*Cactoblastis cactorum*, weed, control, Australia, 78  
*Cajanus cajan*, diseases, Caribbean area, 32; pest, Puerto Rico, 35; pests, Montserrat, 69  
*Capsicum frutescens*, pests, Montserrat, 69  
 Carbaryl, resistance testing, 111, 119  
*Carica papaya*, pests, Montserrat, 69  
 Cartap, pest control, Japan, 88  
 Centre for Overseas Pest Research, 119  
*Cephalosporium diospyri*, weed control, United States, 79
- Ceratophyllum demersum*, 9  
 Chiarappa, L., 65  
*Chilo suppressalis*, rice, Japan, 87  
 Chlordimeform, pest control, 4  
 Chlorobenzilate, pest control, Uganda, 12  
 Choudhury, A.K.S., 51  
 Choudhury, J.H., 48  
*Chrysolina hyperici*, weed control, United States, 78  
*C. quadrigemina*, weed control, United States, 78  
 Cicadellidae, vectors of viruses, 79  
 Citrus, pests, Saudi Arabia, 93  
*Clidemia hirta*, biological control, Fiji, 78  
 CNP, weed control, Japan, 87  
*Cochliobolus bicolor*, *Pennisetum typhoides*, India, 22  
*Colletotrichum* sp., *Solanum* sp., Peru, 46  
*C. gloesporioides*, *Persea americana*, India, 73; weed control, United States, 79; *Pinus caribaea*, Sri Lanka, 94  
*Colocasia esculenta*, pests, Montserrat, 69  
*Combretum glutinosum*, disease, Upper Volta, 138  
 Conference on Virus Disease of Gramineae in Europe, first, 28  
 Consultative Group on International Agricultural Research, 14  
 Copper oxychloride, disease control, 92  
*Corchorus capsularis*, disease, India, 92  
*C. olitorius*, disease, India, 92  
*Cotoneaster salicifolius floccosus*, disease, Federal Republic of Germany, 27  
 Cotton, disease, Upper Volta, 19; see also *Gossypium* sp., *G. Barbadense*  
 Cotton phyllody, crops, Upper Volta, 19, 138  
*Cricanemoides* spp., crops, Montserrat, 70  
*Crotalaria juncea*, disease, India, 92  
*C. retusa*, disease, Upper Volta, 138  
*Cucurbita* sp., pests, Montserrat, 69  
*Cuscuta epithymum*, biological control, U.S.S.R., 79  
*Cyperus*, Ivory Coast, 10
- 2,4-D, weed control, Japan, 87  
*Daucus carota*, pests, Montserrat, 69  
 DDT, prohibited, Japan, 88; resistance testing, 111, 115, 126  
 Desmids, M., 19, 138  
*Dianthus caryophyllus*, pest, 97  
*Diaphorina citri*, citrus, Saudi Arabia, 93  
 Diazinon, resistance testing, 119, 126  
 Dichlorvos, resistance testing, 119  
 Dicofof, pest control, Uganda, 12  
 Dicrotophos, pest control, 3  
 Dieldrex-15, pest control, Malaysia, 24  
 Dieldrin, resistance testing, 119  
 Dimethoate, pest control, 4  
*Diospyros virginiana*, biological control, United States, 79  
 Dithane C-90, disease control, 92  
 Du Pont 1410, pest control, 4  
 Dutch elm disease, control, 5

- Eichhornia crassipes*, 7  
 El Haggagy, M.K., 37  
*Empoasca* sp., 35  
*E. papaya*, *Cajanus cajan*, Puerto Rico, 35  
 Entomological Society of America, 103  
*Epilachna varivestis*, 96  
 EPN, pest control, Japan, 88  
 Eriophyidae, vectors of viruses, 79  
*Erwinia amylovora*, Federal Republic of Germany, 27, France, 28; Japan, free of, 52  
*E. atroseptica*, *Solanum* sp., Peru, 46  
*Eupatorium adenophorum*, biological control, 81  
 European and Mediterranean Plant Protection Organization, 27  
 FAO Working Party of Experts on Pest Resistance to Pesticides, 26, 101  
*Farinocystis tribolii*, *Tribolium* spp., 127  
 Fenitrothion, resistance testing, 119  
*Ficus carica*, pest, India, 50  
 Formetanate, pest control, 4  
 French, E.R., 42  
*Fusarium* spp., pest, 51  
 Gamma-BHC, resistance testing, 119, 126  
*Gardenia ternifolia*, disease, Upper Volta, 138  
*Gossypium* sp., disease, 67; see also Cotton  
*G. barbadense*, pests, Montserrat, 69; see also Cotton  
 Gupta, J.C., 72  
 Hampson, M.C., 53  
 Hawthorn, disease, France, 28  
*Helicotylenchus* spp., crops, soil, Montserrat, 69  
*H. multicinctus*, crops, soil, Montserrat, 70  
*Helminthosporium hawaiiense*, *Zea mays*, India, 22  
*H. rostratum*, *Pennisetum typhoides*, India, 22  
*H. tetramera*, *Zea mays*, India, 21  
*Heterodera rostochiensis*, Japan, New Zealand, U.S.S.R., 28; *Solanum* sp., Peru, 44  
*H. schachtii*, beet, cabbage, Senegal, 24  
*Hibiscus cannabinus*, disease, India, 92  
*H. esculentus*, pests, Montserrat, 69  
*H. sabdariffa*, disease, India, 92  
 Hirumi, H., 32  
*Hypericum perforatum*, biological control, United States, 78  
*Idiocerus atkinsoni*, *Ficus carica*, *Monstera deliciosa*, India, 50  
 Insecticides, 1; woody plants, 76; see also individual compounds  
 International Centre for Tropical Agriculture, phytopathology research and training, 14  
 International Council on Lethal Yellowing, 76  
 International Institute of Tropical Agriculture, phytopathology research and training, 14  
 International Maize and Wheat Improvement Centre, phytopathology research and training, 14  
 International Plant Protection Convention, adherence, Kenya, Malawi, 75  
 International Potato Centre, phytopathology research and training, 14  
 International Rice Research Institute, phytopathology research and training, 14  
 International Symposium on Crop Protection, twentieth, 28  
*Ipomoea batatas*, pests, Montserrat, 69  
 Kalra, S.K., 21  
 Khan, R.M., 74  
 Kimura, M., 32  
 Kok, L.T., 77  
 Laboucheix, J., 19  
*Lactuca* spp., breeding programme, United Kingdom, 28  
*Lantana camara*, biological control, 81  
*Laodelphax striatellus*, rice, Japan, 87  
*Laspeyresia pomonella*, resistance to pesticides, 108  
*Leptinotarsa decemlineata*, resistance to pesticides, 112  
 Lethal yellowing, International Council, 76  
*Liothrips urichi*, weed control, Fiji, 78  
*Locusta migratoria migratorioides*, resistance to pesticides, 117  
*Longidorus* spp., crops, Montserrat, 70; vectors of viruses, 79  
 LPP-1 virus, weed control, 78  
 Luc, M., 24  
*Lucilia* sp., resistance to pesticides, 122  
*L. cuprina*, resistance to pesticides, 122  
*L. sericata*, resistance to pesticides, 122  
*Lycopersicon esculentum*, pests, disease, Montserrat 69, 70  
 Lyon, W.F., 11  
*Macrophoma* sp., *Solanum* sp., Peru, 46  
 MAFe, pest control, Japan, 88  
 Malathion, resistance testing, 119, 126, 127  
 Mango, pests, Ghana, 72  
*Manihot* sp., 12  
*M. esculenta*, pest, Uganda, 11  
*M. utilissima*, pests, Brazil, 12  
 Maramorosch, K., 32  
 MCPA, weed control, Japan, 87  
*Medicago sativa*, pest, 93  
*Meloidogyne* spp., crops, soil, Montserrat, 69  
*M. incognita*, crops, soil, Montserrat, 69  
 Methomyl, pest control, 4  
 Mikhail, S., 37  
 Misra, A.P., 21  
*Mitracarpus scaber*, disease, Upper Volta, 138  
 Mochida, O., 87  
 Monocrotophos, pest control, 4  
*Mononychellus tanajoa*, *Manihot esculenta*, Uganda, 11  
*Mononychus bondari*, *Manihot utilissima*, Brazil, 12  
*M. chaemosetosus*, *Manihot utilissima*, Brazil, 12  
*M. planki*, 12  
*M. tanajoa*, 11  
*Monstera deliciosa*, pest, India, 50  
*Mucuna pachylobium*, pests, Montserrat, 69  
 Mukherjee, N. 92  
 Mukherjee, A.B., 51  
 Mulligan, H.F., 7  
*Musa* sp., pests, Montserrat, 69  
 Mycoplasma treatment, 1; cotton, sesame, Upper Volta, 19; *Cajanus cajan*, 33; crops, Upper Volta, 138  
 Mycoplasmas, 1; woody plants, 76; see also individual compounds  
*Myrothecium roridum*, crops, India, 92

- Nephotettix cincticeps*, rice, Japan, 87  
 Netscher, C., 24  
 Nickel, J.L., 14  
 Nicotine, pest control, 12  
*Nilaparvata lugens*, rice, Japan, 87  
 Nitrofen, weed control, Japan, 87  
*Nomadacris septemfasciata*, resistance to pesticides, 117  
 North Carolina State University, commodity projects, Peru, 42
- Oebalus poecilus*, *Oryza sativa*, Guyana, 82  
*O. pugnax*, *Oryza sativa*, United States, 82  
 Oil palm, pest, Malaysia, 23  
*Olpidium brassicae*, vector of virus, 79  
*Opuntia* spp., biological control, Australia, 78  
*O. bentonii*, biological control, 81  
*O. stricta*, biological control, 81  
 Organomercurials, prohibited, Japan, 88  
*Orosius cellulosus*, vector of disease, Upper Volta, 19, 138  
*Oryza sativa*, pests, Guyana, 82; see also Rice  
*Oryzaephilus mercator*, resistance to pesticides, 127  
*O. surinamensis*, resistance to pesticides, 127
- Padgham, D., 93  
 Panel of Experts on Rice Gall Midge in Asia and the Far East, 26  
*Panonychus ulmi*, resistance to pesticides, 103  
 Parathion, prohibited, Japan, 88  
 Parathion-methyl, resistance testing, 119  
*Paratylenchus* spp., crops, Montserrat, 70  
*Parotis marginata*, *Alstonia scholaris*, Bangladesh, 48  
*Pellicularia sasakii*, rice, Japan, 87  
*Pennicillium* spp., pest, 51  
*Pennisetum typhoides*, diseases, India, 21  
 Pentachlorophenol, weed control, Japan, 87  
*Persea americana*, disease, India, 73  
 Pest management, 65  
*Phaseolus lunatus*, pests, Montserrat, 69  
*P. vulgaris*, disease, 33; pests, Montserrat, 69  
*Philodendron pertusum*, see *Monstera deliciosa*  
*Phoenix dactylifera*, pest, India, 21  
 Phorate, pest control, 4  
*Phytophthora erythroseptica*, *Solanum* sp., Peru, 46  
*P. infestans*, *Solanum tuberosum*, 67  
*Pinus caribaea*, disease, Sri Lanka, 94  
*P. insularis*, Sri Lanka, 94  
*P. patula*, Sri Lanka, 94; disease, 96  
*Piricularia oryzae*, rice, Japan, 87  
*Pistia stratiotes*, distribution, Ivory Coast, disease spread, 7  
*Plasmopara viticola*, *Vitis vinifera*, 67  
*Podosphaera leucotricha*, apple, Sri Lanka, 96  
*Polygonum senegalense*, 9  
*Polymyxa graminis*, vector of virus, 79  
 Potato, disease, Canada, 53; see also *Solanum* sp., *S. tuberosum*  
*Pratylenchus* spp., crops, Montserrat, 70  
 Proudfoot, K.G., 53  
*Prunus armeniaca*, disease, 67  
*P. persica*, disease, 67  
*Pseudomonas solanacearum*, *Solanum* sp., Peru, 46  
*Psilenchus* spp., *Phaseolus vulgaris*, Montserrat, 70  
 Publications, 100, 144  
*Puccinia arachidis*, *Arachis hypogaea*, 29  
*P. graminis tritici*, *Triticum* sp., 66
- Pycnoscelus* sp., oil palm, Malaysia, 23  
*P. indicus*, 23  
*P. surinamensis*, 23
- Quarantine, Europe and Mediterranean, 142; Fiji, 71; Guam, 97; Turkey, United Kingdom, 52
- Radopholus similis*, 71  
 Rai, B.K., 82  
 Rassel, A., 138  
 Rhabdovirus, *Cajanus cajan*, 34  
*Rhagoletis cerasi*, United States, free of, 52  
*Rhizoctonia solani*, *Gossypium* sp., 67  
*Rhynchosia minima*, disease, Puerto Rico, 32  
*Rhyzopertha dominica*, resistance to pesticides, 127  
 Rice, diseases, pests, Japan, 87; see also *Oryza sativa*  
*Rosellinia arcuata*, apple, *Pinus patula*, tea, Sri Lanka, 96  
*R. necatrix*, apple, 96  
*Rotylenchulus* spp., crops, Montserrat, 70  
*R. reniformis*, crops, soil, Montserrat, 69  
*Rotylenchus* spp., *Capsicum frutescens*, Montserrat, 70
- Salvinia*, 7  
*Saponaria officinalis*, pest, 97  
*Schistocerca gregaria*, resistance to pesticides, 117  
 Schwarz, R.E., 1  
*Scirpus*, Ivory Coast, 10  
*Scirtothrips manihoti*, 12  
*Sclerotinia laxa*, *Prunus armeniaca*, 67  
*Sclerotium cepivorum*, *Allium cepa*, Egypt, 37  
*S. rolfsii*, 37; *Lycopersicon esculentum*, Montserrat, 70  
*Scolytus multistriatus*, control, 3  
 Seng, T.G., 23  
*Septoria*, research, wheat, 75  
*S. lycopersici*, *Solanum* sp., Peru, 46  
 Sesame, disease, Upper Volta, 19; see also *Sesamum orientale*  
*Sesamum orientale*, disease, Upper Volta, 138; see also Sesame  
 Shanmuganathan, N., 94  
 Sharma, S.K., 74  
*Sida* spp., disease, Upper Volta, 138  
*S. cordifolia*, disease, Upper Volta, 19, 138  
*S. rhombifolia*, disease, Upper Volta, 138  
 Singh, R., 21  
 Singh, T.B., 21  
*Sitophilus granarius*, resistance to pesticides, 127  
*S. oryzae*, resistance to pesticides, 127  
*S. zeamais*, resistance to pesticides, 127  
*Sogatella furcifera*, rice, Japan, 88  
 Sohii, H.S., 73  
*Solanum* sp., diseases, pests, Peru, 43; see also Potato  
*S. melongena*, pests, Montserrat, 69  
*S. tuberosum*, disease, 67; see also Potato, *Solanum* sp.  
*Spongopora subterranea*, vector of virus, 79  
 Sridhar, T.S., 73  
 Stewart, D.M., 37  
*Subcochinella vigintiquatropunctata*, United States, 96; crops, 97  
 Sulphur, pest control, 12  
*Sylepta marginata*, see *Parotis marginata*  
*Synchytrium endobioticum*, potato, introduction, distribution, control, Canada, 53; United States, free of, 76; vector of virus, 79

- Taphrina deformans*, *Prunus persica*, 67  
 Tea, disease, Sri Lanka, 96  
 TEPP, prohibited, Japan, 88  
 Tetracycline, treatment of mycoplasma, woody plants, 1  
 Tetranychidae, vectors of viruses, 79  
*Tetranychus* spp., resistance to pesticides, 103  
*T. opuntiae*, weed control, Australia, 78  
*T. tanajoa*, 11  
*T. urticae*, resistance to pesticides, 103  
*Tribolium castaneum*, resistance to pesticides, 127  
*T. confusum*, resistance to pesticides, 127  
*Trichodorus* spp., vectors of viruses, 79  
*Trioza* (*Spanioza*) *erytrae*, citrus, Saudi Arabia, 93  
*Tripsacum laxum*, disease, 95  
*Triticum* sp., disease, 66; see also Wheat  
*Tylenchorhynchus* spp., crops, soil, Montserrat, 69  
*Tylenchus* spp., crops, Montserrat, 70  
*Tyrophagus putrescentiae*, *Agaricus* sp., *Volvaria* spp., India, 51
- Uncinula necator*, *Vitis vinifera*, 67  
*Urena lobata*, disease, India, 92  
 U.S. Agency for International Development, 42  
*Utricularia*, Ivory Coast, 9
- Vakili, N.G., 32  
*Vetiveria zizanioides*, disease, Sri Lanka, 95
- Virus diseases  
 citrus greening, 1  
 pigeon pea yellow mosaic, 32  
*Rhynchosia* mosaic, 32  
 aster yellows, 46  
 potato mop top, 46  
 potato purple top, 46  
*Vitis vinifera*, diseases, 67  
*Volvaria* spp., pest, India, 51  
*Vossia cuspidata*, 9
- Wheat, pests, India, 74; see also *Triticum* sp.  
 Wilkinson, R.E., 37  
*Wissadula amplissima*, disease, Upper Volta, 138  
 Wooler, A., 93  
 Workshop on Pest and Disease Appraisal and Control by Management Systems, 27  
 World Bank, 14  
 World Food Conference, 101
- Xanthomonas* sp., *Vetiveria zizanioides*, Sri Lanka, 95  
*X. oryzae*, rice, Japan, 87  
*Xiphinema* spp., crops, Montserrat, 70; vectors of viruses, 79  
*Zea mays*, diseases, India, 21  
 Zethner, O., 48  
*Zinnia elegans*, disease, Upper Volta, 138

## ERRATA

(The line numbers do not take account of titles and headings)

- |                                  |  |
|----------------------------------|--|
| Page 12, column 2, line 10:      | for dicafol read dicofol   |
| Page 35, column 2, line 24:      | for <i>C. Cajan</i> read <i>C. cajan</i>                           |
| Page 87, column 2, line 30:      | for Jamaica read Japonica  |
| Page 96, column 2, line 7 :      | for <i>R. nectarix</i> read <i>R. necatrix</i>                     |
| Page 97, Guam, column 2, line 4: | for Europe (Mediterranean) read Europe and Mediterranean           |
| Page 115, column 2, line 31:     | for 9.2 (males) and 8.4 (females) read 62 (males) and 42 (females) |